

CLAIMS

What is claimed is:

1. A system for power management of a group of computers, the system
5 comprising:
server side infrastructure (SSI) circuitry at each computer in the group, the
SSI circuitry including local monitoring circuitry coupled to a central
processing unit (CPU) of the computer; and
a centralized power management module (CPMM) with a management
10 link to the SSI circuitry at each computer in the group,
wherein the local circuitry at each computer in the group monitors power
consumption at the CPU and transmits power consumption data to
the CPMM, and
wherein the CPMM applies a set of rules to the power consumption data
15 to determine when and at which computers to enable and disable a
CPU power throttling mode.
2. The system of claim 1, wherein the group of computers comprises
multiple servers mounted in a rack.
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3. The system of claim 1, wherein the group of computers comprises a
plurality of blade servers in a blade chassis.
4. The system of claim 1, wherein the group of computers comprises a
25 group of workstations.
5. The system of claim 1, further comprising:
a console coupled to the CPMM for user interaction.
- 30 6. The system of claim 5, wherein the console comprises a console
connected locally to the CPMM.

7. The system of claim 5, wherein the console comprises a remote console coupled via a network to the CPMM.
8. The system of claim 5, wherein the system is configured to enable a user to setup the aforementioned rules by way of the console.
9. The system of claim 5, wherein the system is configured to enable a user to view power consumption data by way of the console.
10. The system of claim 1, further comprising:
additional CPMMs with management links to SSI circuitry at additional groups of computers; and
a power management system coupled to the plurality of CPMMs.
11. The system of claim 10, wherein the power management system is configured to enable a user to view power consumption data and to customize the sets of rules applied by the CPMMs.
12. A server-side apparatus for a rack-mounted computer, the apparatus comprising:
a local monitoring circuitry coupled to a central processing unit (CPU) of the computer and coupled to a centralized power management system,
wherein the local circuitry is configured to monitor power consumption at the CPU, transmit power consumption data to the centralized power management system, receive management messages from the centralized power management system, and send commands to enable and disable a power throttling mode at the CPU.
13. The apparatus of claim 12, further comprising:
a power measurement link between the local monitoring circuitry and the CPU for monitoring power consumption at the CPU.

14. The apparatus of claim 13, further comprising:
an interrupt line between the local monitoring circuitry and the CPU for
transmitting interrupt messages that enable and disable the power
throttling mode at the CPU.
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15. The apparatus of claim 13, further comprising:
a special register writable by the local monitoring circuitry and readable by
the CPU to enable and disable the power throttling mode at the
CPU.
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16. A central power management apparatus for a group of computers
mounted in a rack, the apparatus comprising:
a management module coupled to local monitoring circuitry at each
computer in the group,
15 wherein the management module is configured to receive power
consumption data from the local monitoring circuitry, determine at
which computers to enable and disable a CPU power throttling
mode, and transmit messages to said determined computers to
enable and disable the CPU power throttling mode.
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17. A method for power management of a group of computers, the method
comprising:
monitoring power consumption at each computer in the group; and
transmitting power consumption data from each computer in the group to
25 a centralized power manager.
18. The method of claim 17, further comprising:
transmitting messages from the centralized power manager to local
circuitry at said determined computers to enable and disable the
30 CPU power throttling mode at those computers; and
applying a configurable set of rules to the power consumption data to
determine at which computers to enable and disable a CPU power
throttling mode.

19. The method of claim 18, wherein the group of computers comprises a rack of servers, and the centralized power manager comprises a rack-level power manager.
- 5 20. A centralized method for managing power consumption of a group of computers, the method comprising:
receiving power consumption data from local monitoring circuitry at each
of the computers;
10 determining at which computers to enable and disable a CPU power throttling mode; and
transmitting messages to said determined computers to enable and
disable the CPU power throttling mode.
- 15 21. The method of claim 20, wherein the group of computers comprises a rack of servers.
22. A power management apparatus for managing power usage of a group of computers at a rack-level, the apparatus comprising:
20 means for receiving power consumption data from the local monitoring circuitry;
means for determining at which computers to enable and disable a CPU power throttling mode; and
means for transmitting messages to said determined computers to enable
25 and disable the CPU power throttling mode.
23. The apparatus of claim 22, wherein the group of computers comprises a rack of servers.

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